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BEFORE THE BOARD OF PATENT APPEALS AND INTERFERENCES

Application Number: 10/823,183
Filing Date: April 13, 2004
Appellant(s): LAFON, PHILIPPE

Utpal D. Shah
For Appellant

EXAMINER'S ANSWER

This is in response to the appeal brief filed 11/13/2008 appealing from the Office action mailed 9/17/2008.

(1) Real Party in Interest

A statement identifying by name the real party in interest is contained in the brief.

(2) Related Appeals and Interferences

The examiner is not aware of any related appeals, interferences, or judicial proceedings which will directly affect or be directly affected by or have a bearing on the Board's decision in the pending appeal.

(3) Status of Claims

The statement of the status of claims contained in the brief is correct.

(4) Status of Amendments After Final

No amendment after final has been filed.

(5) Summary of Claimed Subject Matter

The summary of claimed subject matter contained in the brief is correct.

(6) Grounds of Rejection to be Reviewed on Appeal

The appellant's statement of the grounds of rejection to be reviewed on appeal is correct.

(7) Claims Appendix

The copy of the appealed claims contained in the Appendix to the brief is correct.

(8) Evidence Relied Upon

5969770	Horton	10-1999
6853385	MacInnis et al.	2-2005
6369855	Chauvel et al.	4-2002

6057909	Yahav et al.	5-2000
20030027517	Callway et al.	2-2003

(9) Grounds of Rejection

The following ground(s) of rejection are applicable to the appealed claims:

Claim Rejections - 35 USC § 103

1. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

2. Claims 1-4, 6-12, 16-17 and 22-27 are rejected under 35 U.S.C. 103(a) as being unpatentable over Horton (US 5,969,770), and further in view of MacInnis et al. (US 6,853,385; hereinafter MacInnis).

3. Regarding claim 1, Horton (Fig. 1, col. 2 lines 35-43 and lines 55-67, col. 3 lines 29-32 and lines 66-67, col. 4 lines 1-24, col. 5 lines 15-17, col. 7 lines 12-17, lines 49-58, col. 8 lines 4-8 and lines 32-35) teaches a processor (microprocessor) based method comprising combining (superimpose/overlay) a digital graphics object (OSD graphics/graphics image) and a digital picture (digital video signal/video image) while each of the digital graphics object and the digital picture are in compressed format (4:2:2 format), and displaying the combined digital graphic object and digital picture (display screen 19).

Although Horton teaches the limitations as stated above, Horton does not explicitly teach using weight factor proportional to a plurality of luminance values in the

digital graphics object with each of the plurality of luminance values having a value indicating transparency, to combine the digital graphics object and a digital picture. However, MacInnis teaches an alpha value (weight factor) included in YUV format dependent on luma (luminance), which is used to blend (overlay) a top-layer and a bottom-layer. MacInnis further teaches to pre-multiply luma values with the filtered alpha values to form the composite alpha values used to blend the graphics image and video (col. 7 lines 38-41, col. 9 lines 37-40, col. 16 lines 43-46, col. 46 lines 45-56, col. 111 lines 65-67, col. 112 lines 1-53, col. 18 lines 51-67, col. 120 lines 13-14; alpha value ... depend on ... alpha from chroma keying ... alpha from Y (luma) corresponds to weight factor proportional to luminance value; Y component having a value of zero indicates transparency and corresponds to one of the luminance value; Y component having a value other than zero indicates the pixel is opaque and corresponds to a different luminance value; thus "0" or "any value other than zero" corresponds to the plurality of luminance values, where each of the plurality of luminance values has a value that indicates transparency of the pixel; it should be noted that the specification states the luminance value in the compressed graphics object can indicate transparency or non-transparency, see pg. 13 paragraph [0039] of the specification; based on the specification, the examiner interprets that the luminance value indicating transparency and the luminance value indicating non-transparency are two different values; these luminance values correspond to the plurality of luminance values; it should also be noted that the weight factor is proportional to a plurality of luminance values, and MacInnis teaches that a zero or a non-zero value of a Y component (luminance)

indicates transparency, and that the alpha value depends on the luma; it should be further noted that a plurality of luminance values as claimed is interpreted as a plurality of luminance values of a pixel, i.e. one indicating transparency and other indicating non-transparency). Therefore, it would have been obvious to one of ordinary skill in the art at the time of present invention to use alpha values in blending two graphics layer as taught by MacInnis into the system of Horton because composite alpha values formed by pre-multiplying alpha values with luma values are used blend the graphic image and the video that results in best visual quality display (col. 46 lines 45-56, col. 118 lines 56-60).

4. Regarding claim 2, Horton teaches compressing the digital graphics object (OSD graphics) to be in the compressed format (4:2:2 format) (col. 7 lines 49-67 and col. 8 lines 1-8).

5. Regarding claim 4, Horton discloses all of the claimed limitations as stated above, except that Horton does not explicitly teach calculating the weight factor during compressing, and storing the weight factor within the digital graphics object. However, MacInnis teaches to convert raw graphics data (original format of graphics object) into YUVa format (compressed format) using YUV 4:2:2 plus an 8-bit alpha value (weight factor) for every pixel (col. 9 lines 24-40, col. 26 lines 3-17; pixel of graphic data containing the alpha value corresponds to storing the weight factor within the graphics object). Therefore, it would have been obvious to one of ordinary skill in the art at the time of present invention to determine the alpha value while converting the raw graphics data into YUVa format as taught by MacInnis and use it into the system of Horton

because the graphics converter that converts the graphics data into a YUVa format, providing the data and the alpha values to the graphics blender, has a capacity of performing low pass filtering to filter out high frequency components needed (col. 26 lines 3-17).

6. Regarding claim 6, Horton teaches to compress the digital graphics object in 4:4:4 space to one of 4:2:2 space or 4:2:0 space (col. 7 lines 49-67 and col. 8 lines 1-8).

7. Regarding claim 10, Horton teaches combining while both the digital graphics object and the digital picture are in a 4:2:2 space format (col. 7 lines 12-17, lines 49-54, lines 57-58, col. 8 lines 4-8, lines 32-35).

8. Regarding claim 11, Horton teaches combining the digital graphics object and the digital picture (col. 7 lines 12-17, lines 49-54, lines 57-58, col. 8 lines 4-8, lines 32-35). Horton does not explicitly teach that the digital graphics object and the digital picture are in 4:2:0 space format. However, Horton teaches 4:2:0 space format (col. 7 lines 17-22). Horton also teaches the graphic image sequence and video image sequence needs to be in the same format to insert a graphics image into a video image (col. 7 line 67, col. 8 lines 1-3; graphic image sequence corresponds to digital graphics object; video image corresponds to digital picture; insert corresponds to overlay). At the time the invention was made, it would have been obvious to one of ordinary skill in the art to have the digital graphics object and the digital picture in compressed format 4:2:0, instead of 4:2:2 compressed format as taught by Horton. Applicant has not disclosed that using 4:2:0 compressed format provides an advantage, is used for a particular purpose, or solves a stated problem. One of ordinary skill in the art, furthermore, would have

expected Applicant's invention to perform equally well with 4:2:2 compressed format of Horton because the processor workload for processing compressed digital data is significantly lower than that required for processing the same data in uncompressed form, and thus resulting in a better processor performance. Therefore, it would have been obvious to one of ordinary skill in this art to modify the compression format used by Horton to obtain the invention as specified in claim 17.

9. Regarding claim 12, Horton (Fig. 1, col. 2 lines 35-43 and lines 55-67, col. 3 lines 29-32, col. 5 lines 15-17, col. 7 lines 12-17, lines 49-58, col. 8 lines 4-8 and lines 32-35) teaches a system (digital satellite television system) comprising a processor (microprocessor), a memory coupled to the processor ("read-only" memory (ROM)), and the processor executing a program (in response to a control program) overlaying (superimpose/overlay) a digital graphics object (OSD graphics/graphics image) and a digital picture (digital video signal/video image) while both the digital graphics object and the digital picture are in compressed format (4:2:2 format).

Although Horton teaches the limitations as stated above, Horton does not explicitly teach using weight factor proportional to a plurality of luminance values in the digital graphics object with each of the plurality of luminance values having a value indicating transparency, to combine the digital graphics object and a digital picture. However, MacInnis teaches an alpha value (weight factor) included in YUV format dependent on luma (luminance), which is used to blend (overlay) a top-layer and a bottom-layer. MacInnis further teaches to pre-multiply luma values with the filtered alpha values to form the composite alpha values used to blend the graphics image and video

(col. 7 lines 38-41, col. 9 lines 37-40, col. 16 lines 43-46, col. 46 lines 45-56, col. 111 lines 65-67, col. 112 lines 1-53, col. 18 lines 51-67, col. 120 lines 13-14; alpha value ... depend on ... alpha from chroma keying ... alpha from Y (luma) corresponds to weight factor proportional to luminance value; Y component having a value of zero indicates transparency and corresponds to one of the luminance value; Y component having a value other than zero indicates the pixel is opaque and corresponds to a different luminance value; thus "0" or "any value other than zero" corresponds to the plurality of luminance values, where each of the plurality of luminance values has a value that indicates transparency of the pixel; it should be noted that the specification states the luminance value in the compressed graphics object can indicate transparency or non-transparency, see pg. 13 paragraph [0039] of the specification; based on the specification, the examiner interprets that the luminance value indicating transparency and the luminance value indicating non-transparency are two different values; these luminance values correspond to the plurality of luminance values; it should also be noted that the weight factor is proportional to a plurality of luminance values, and MacInnis teaches that a zero or a non-zero value of a Y component (luminance) indicates transparency, and that the alpha value depends on the luma; it should be further noted that a plurality of luminance values as claimed is interpreted as a plurality of luminance values of a pixel, i.e. one indicating transparency and other indicating non-transparency). Therefore, it would have been obvious to one of ordinary skill in the art at the time of present invention to use alpha values in blending two graphics layer as taught by MacInnis into the system of Horton because composite alpha values formed

by pre-multiplying alpha values with luma values are used blend the graphic image and the video that results in best visual quality display (col. 46 lines 45-56, col. 118 lines 56-60).

10. Regarding claim 16, Horton teaches the processor (microprocessor, Fig. 1, col. 5 lines 15-17) executing the program overlays the digital graphics object and the digital picture while each of the digital graphics object and the digital picture are in a 4:2:2 space format (col. 7 lines 12-17, lines 49-54, lines 57-58, col. 8 lines 4-8, lines 32-35).

11. Regarding claim 17, the statements presented above, with respect to claims 11 and 12, are incorporated herein.

12. Regarding claim 22, Horton teaches a computer readable medium ("read-only" memory (ROM)) storing a program (control program) (Fig. 1, col. 5 lines 15-17) that when executed by a processor, performs a method comprising overlaying a graphics object onto a picture using a weight factor proportional to a plurality of luminance values in the graphics object that indicate transparency, while both the graphics object and the picture are in a compressed format (col. 7 lines 12-17, lines 49-54, lines 57-58, col. 8 lines 4-8, lines 32-35). For further details, refer to the rejection of claim 12.

13. Regarding claim 23, Horton discloses all of the claimed limitations as stated above, except that Horton does not explicitly teach to overlay a chrominance value in the graphics object with a chrominance value onto the picture based on the weight factor, the weight factor proportional to a number of luminance values in the graphics object having values that indicate transparency. However, MacInnis teaches an alpha value included in YUV format dependent on keying (chroma or luma) and luma, which is

used to blend a top-layer and a bottom-layer (col. 7 lines 38-41, col. 9 lines 37-40, col. 35 lines 11-29, col. 46 lines 45-56, col. 112 line 1, lines 16-23, lines 32-42 and lines 47-53, col. 118 lines 51-67, col. 120 lines 13-14i alpha/alpha value/composite alpha value corresponds to weight factor; alpha value ... depend on ... alpha from chroma keying ... alpha from Y (luma) corresponds to weight factor proportional to luminance value; composite alpha value based on alpha values per pixel corresponds to summation of alpha values of each pixel in the object; when the Y component ... pixel is typically set to be transparent corresponds to weight factor proportional to a number of luminance values in the graphics object having values indicating transparency; video signal/bottom layer corresponds to digital picture; graphics data/top layer corresponds to graphics object; blend corresponds to overlay; the chroma ... from the luma corresponds overlaying a chrominance value). Therefore, it would have been obvious to one of ordinary skill in the art at the time of present invention to blend the chroma values of two layers separately as taught by MacInnis and use it into the system of Horton because such a blending helps to achieve best visual quality (col. 118 lines 56-57).

14. Regarding claim 24, Horton discloses all of the claimed limitations as stated above, except that Horton does not explicitly teach to calculate the weight factor contemporaneously with the overlaying. However, MacInnis teaches a blending method to maintain an intermediate alpha value at each stage of the blending operation (col. 47 lines 64-66, col. 48 lines 1-19, col. 49 lines 12-25; blending corresponds to overlaying; intermediate alpha value/alpha value corresponds to weight factor; at each stage ... alpha value is maintained corresponds to calculating the weight factor

contemporaneously with overlaying; calculated using a keying function corresponds to calculating the weight factor). Therefore, it would have been obvious to one of ordinary skill in the art at the time of present invention to calculate intermediate alpha values as taught by MacInnis and use it into the system of Horton because intermediate alpha value thus calculated and maintained is later used for blending with the layers that are not to be filtered (col. 47 lines 64-67).

15. Regarding claim 25, Horton discloses all of the claimed limitations as stated above, except that Horton does not explicitly teach to read the weight factor from the graphics object prior to the overlay of the chrominance values. However, MacInnis teaches a blending method in which alpha values (weight factor) can be read from the memory as part of the pixel value that corresponds to the upper layers (col. 47 lines 52-54, col. 49 lines 12-67; upper layers may be graphics windows corresponds to graphics object; pixel values of the upper layers, that is read from the memory, contains the alpha values). Therefore, it would have been obvious to one of ordinary skill in the art at the time of present invention to read the alpha value from the pixel of upper layer of graphics object as taught by MacInnis and use it into the system of Horton because before compositing begins, these alpha values are multiplied with chrominance values (U and V values) of a pixel of the current layer before overlaying with the chrominance values of the pixel of the next layer by accounting for the offset nature of the chrominance values (U and V values) (col. 49 lines 32-57).

16. Regarding claim 26, the statements presented above, with respect to claims 22 and 16, are incorporated herein.

17. Regarding claim 27, the statements presented above, with respect to claims 11 and 22, are incorporated herein.

18. Regarding claim 3, the statements presented above, with respect to claims 2 and 23, are incorporated herein.

19. Regarding claim 7, the statements presented above, with respect to claims 1 and 23, are incorporated herein.

20. Regarding claim 8, the statements presented above, with respect to claims 7 and 24, are incorporated herein.

21. Regarding claim 9, the statements presented above, with respect to claims 7 and 25, are incorporated herein.

22. Claims 5 is rejected under 35 U.S.C. 103(a) as being unpatentable over Horton and MacInnis, and further in view of Chauvel et al. (US 6,369,855; hereinafter Chauvel).

23. Regarding claim 5, the combination of Horton and MacInnis disclose all of the claimed limitations as stated above, except that they do not explicitly teach storing the weight factor in the least significant bits of the chrominance value. However, Chauvel teaches to determine the amount of blending (weight factor) by the LSB of the chrominance components of the pixel of the bitmap (col. 113 lines 36-67, col. 114 lines 43-67; the blend factor corresponds to the LSB of the Cb and Cr values that are stored in the CLUT entry corresponding to that pixel of the bitmap 4:2:2 displays corresponds to storing the weight factor in LSB of the chrominance values). Therefore, it would have been obvious to one of ordinary skill in the art at the time of present invention to

calculate the weight factor and store it within the graphics object as taught by Chauvel and use it into the system of Horton and MacInnis because the blending factor determined by the LSB of the chrominance components of the pixel supports color blending on the pixel level for the bitmap displays (col. 114 lines 49-54).

24. Claim 13 is rejected under 35 U.S.C. 103(a) as being unpatentable over Horton and MacInnis, and further in view of Yahav et al. (US 6,057,909; hereinafter Yahav).

25. Regarding claim 13, the combination of Horton and MacInnis discloses all of the claimed limitations as stated above, except that they do not explicitly teach that the system comprises of a charge coupled device (CCD) array coupled to the processor, and the processor acquires the digital picture using the CCD array. However, Yahav teaches a CCD array coupled to a video processor (Fig. 10, col. 19 lines 39-44; camera 110 corresponds to the system; video processor 116 corresponds to the processor; matrix array 112 corresponds to the CCD array; image-responsive video signals corresponds to digital picture; receives image-responsive video signals corresponds to acquiring digital picture). Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to use a CCD array of Yahav into the system of Horton and MacInnis because a CCD camera produces an image of a narrow, linear portion of an object or scene (col. 19 lines 30-32).

26. Claims 14 and 15 are rejected under 35 U.S.C. 103(a) as being unpatentable over Horton and MacInnis, and further in view of Callway et al. (US 2003/0027517; hereinafter Callway).

27. Regarding claim 14, Horton teaches a radio receiver coupled to the processor receiving at least one of the digital pictures or the digital graphics object through the transceiver (Fig. 1, col. 3 lines 29-32, col. 4 lines 4-7; television signals corresponds to digital picture; antenna assembly corresponds to radio receiver; satellite receiver with microprocessor corresponds to processor; retransmitted television signals are received corresponds to receiving digital picture).

Although the combination of Horton and MacInnis disclose the claimed limitations as stated above, they do not explicitly teach that the receiver is a wireless transceiver. However, Callway teaches a wireless transceiver coupled to a graphics processing circuit that includes a wireless receiver to receive the transmitted data (Fig. 1, pg. 2 [0016] lines 6-9, pg. 5 [0043] lines 8-13, [0045] lines 13-15; radio frequency based wireless transceiver corresponds to wireless radio transceiver; graphics processing circuit corresponds to processor). Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to use the wireless radio transceiver of Callway into the system of Horton and MacInnis because a wireless system does not require cabling to provide image data from an image source to a receiving unit (pg. 2 [0015] last four lines).

28. Regarding claim 15, the combination of Horton and MacInnis discloses all of the claimed limitations as stated above, except that they do not explicitly teach that the

radio transceiver coupled to the processor transmits the digital picture created by the overlaying of the digital graphics object and the digital picture using the transceiver. However, Callway teaches a wireless transceiver coupled to a graphics processing circuit (Fig. 1, pg. 2 [0016] lines 6-9 and [0022] last 5 lines, pg.3 [0024] lines 1-4, pg. 5 [0043] lines 8-13; radio frequency based wireless transceiver corresponds to wireless radio transceiver; graphics processing circuit corresponds to processor; wireless transmitter corresponds to wireless transceiver; encoding corresponds to compressing; encoded rendered graphics data corresponds to digital graphics object; recompressed decoded video corresponds to digital picture; modulated compressed frames corresponds to digital picture created by the overlaying). Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to use the wireless radio transceiver of Callway into the system of Horton and MacInnis because a wireless system does not require cabling to provide image data from an image source to a receiving unit (pg. 2 [0015] last four lines).

(10) Response to Argument

29. Regarding claims 1-17 and 22-27, appellant argues that MacInnis fails to teach "... a weight factor proportional to a plurality of luminance values in the graphics object that indicate transparency" (see page 12 of appeal brief). Appellant further argues that Horton and MacInnis do not teach "combining a digital graphics object and a digital picture using weight factor proportional to a plurality of luminance values in the digital graphics object with each of the plurality of luminance values having a value indicating

transparency" (see page 12 of appeal brief). Appellant further argues that MacInnis does not teach "... the alpha value is determined based on a plurality of luminance values" (see page 13 of appeal brief).

30. However, the examiner interprets that although Horton does not explicitly teach using weight factor proportional to a plurality of luminance values in the digital graphics object with each of the plurality of luminance values having a value indicating transparency, to combine the digital graphics object and a digital picture, MacInnis teaches an alpha value (weight factor) included in YUV format dependent on luma (luminance), which is used to blend (overlay) a top-layer and a bottom-layer. MacInnis further teaches to pre-multiply luma values with the filtered alpha values to form the composite alpha values used to blend the graphics image and video (col. 7 lines 38-41, col. 9 lines 37-40, col. 16 lines 43-46, col. 46 lines 45-56, col. 111 lines 65-67, col. 112 lines 1-53, col. 18 lines 51-67, col. 120 lines 13-14; alpha value ... depend on ... alpha from chroma keying ... alpha from Y (luma) corresponds to weight factor proportional to luminance value; Y component having a value of zero indicates transparency and corresponds to one of the luminance value; Y component having a value other than zero (typically the range is between 16 and 235) indicates the pixel is opaque and corresponds to a different luminance value; thus "0" or "any value other than zero" corresponds to the plurality of luminance values, where each of the plurality of luminance values has a value that indicates transparency of the pixel; it should be noted that the specification states the luminance value in the compressed graphics object can indicate transparency or non-transparency, see pg. 13 paragraph [0039] of the

specification; based on the specification, the examiner interprets that the luminance value indicating transparency and the luminance value indicating non-transparency are two different values; these luminance values correspond to the plurality of luminance values; it should be further noted that a graphics object has a plurality of pixels; it should also be noted that the weight factor is proportional to a plurality of luminance values, and MacInnis teaches that a zero or a non-zero value of a Y component (luminance) indicates transparency, and that the alpha value depends on the luma; it should be further noted that a plurality of luminance values as claimed is interpreted as a plurality of luminance values of a pixel, i.e. one indicating transparency and other indicating non-transparency). Therefore, it would have been obvious to one of ordinary skill in the art at the time of present invention to use alpha values in blending two graphics layer as taught by MacInnis into the system of Horton because composite alpha values formed by pre-multiplying alpha values with luma values are used blend the graphic image and the video that results in best visual quality display (col. 46 lines 45-56, col. 118 lines 56-60).

(11) Related Proceeding(s) Appendix

No decision rendered by a court or the Board is identified by the examiner in the Related Appeals and Interferences section of this examiner's answer.

For the above reasons, it is believed that the rejections should be sustained.

Respectfully submitted,

/Jwalant Amin/

Examiner, Art Unit 2628

December 16, 2008

Conferees:

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